

REMARKS

Claims 1-11, 13-18, 21-23, 27-52 and 56-57 are currently pending and have been examined. Applicants acknowledge the receipt by the Office of priority documents relating to the claimed German applications.

Applicants acknowledge the withdrawal of the objection to claims 1, 11, 27, 36 and 56 and the rejection of claims 1-11, 13-18, 21-23, 27-52, 56 and 57 as indefinite.

The Office is maintaining a rejection of claims over the combination of Pirrung et al. (U.S. Patent No. 5,143,854; hereinafter "Pirrung") and Derndinger et al. (U.S. Patent No. 5,239,178; hereinafter "Derndinger"). The Office Action argues that the Derndinger reference is analogous art because confocal microscopy is used commonly for quality control purposes in microarray manufacturing. Confocal microscopy optics, however, are not used to illuminate specific areas of microarrays during synthesis, but only to observe the microarray visually. The Office concedes as much in citing the exemplary references U.S. Patent Nos. 5,736,257 and 6,114,123. In both of these cases, confocal microscopy is used to take photographs of biochips that have already been manufactured and labeled with florescent probes. The problem to be solved here is to manufacture an array by illuminating discrete pixels of the array with confirmation that the light is illuminating the proper areas. The cited references only show that one can photograph or view an array. Applicants maintain that this art is non-analogous and is not pertinent to microarray manufacturing as claimed here.

The Office Action refers to col. 4, lines 13-17, of Derndinger for disclosing an adjusting device to move the illumination grid relative to the object being viewed. This disclosure does not teach anything relating to adjusting a location-specific illumination pattern as is claimed here. The adjustment referred to in Derndinger is a movement of the light source and object in planes perpendicular to the optical axis (col. 4, lines 15-16). This allows the microscopist to focus light on different planes within the object, but does not allow one to detect where on the surface the light is falling or allow the pattern of illumination to be changed. In fact there is no pattern of illumination and there is absolutely no teaching of methods or any device for detecting whether the illumination in

Derndinger is correct. Derndinger allows one to focus illumination on a particular plane of the biochip for viewing and photography. There is no disclosure whatsoever of a pattern whereby light falls only on discrete pixels of the array (and not others) and no teaching or suggestion that there is any way to confirm where the light is illuminating the array. Therefore, Derndinger does not teach or suggest that illumination is falling on any precise desired location of array.

The Office notes that the illumination pattern is adjustable rather than adjusted in the claims, so this is not considered a method step necessary to the claim. The combined references, however, do not disclose any device capable of detecting whether light is correctly illuminating the particular desired locations. In order to make out a prima facie case of obviousness, the Office is required to make a showing that the cited references disclose all elements of the claim. The Office may not merely assert this as a fact without any evidence and then request that the applicant disprove it. It is the Office's burden to come forward with evidence and to point to locations in the cited references which disclose each and every element of the claim. Here, there is no evidence provided by the Examiner that the references disclose explicitly or inherently, or even suggest, illumination pattern detection.

Applicants therefore request withdrawal of the rejections on grounds of obviousness for the reasons that the art cited concerning confocal microscopy is not analogous art and would not be considered by the person of skill in the art to even relate to the same problem presented here, and because the combination of cited art does not disclose, suggest all elements of the claims or render them obvious. The Examiner has noted that because the claims use the term "adjustable," adjustment of the location specific illumination pattern is not considered to be a limitation of the method claim. Adjustment is an optional step in the method, however the claims do recite that the location specific illumination pattern is adjustable. There is no teaching in the art concerning adjustment of the illumination pattern and disclosure that would render such illumination pattern adjustment likewise is absent. Applicants respectfully submit that this feature of the illumination pattern is an element of the claim, and is required for step (c), which recites optionally adjusting the illumination pattern.

The Office Action states that Derndinger teaches that it is advantageous to provide adjustment which makes it possible to move the illumination grid. Derndinger, however, only teaches adjustment in one dimension in order to provide confocal focusing of the light, and does not teach or suggest any location specific illumination of the surface or adjustment thereof. The claims here specifically recite that it is the location specific illumination pattern which is adjusted and that the method uses an illumination matrix to illuminate specific and predetermined areas of the biochip surface. This clearly is not the same problem as focusing light in a plane for confocal photography.

The Office Action has discounted any statements made by Applicants concerning whether the Derndinger device is capable of detecting whether a particular light source is actually illuminating a particular location of an object. The reason given is that arguments of counsel cannot take the place of evidence and that evidence is required to rebut a prima facie case of obviousness. Applicants submit, however, that it is the Office's burden to prove with evidence the prima facie case in the first instance. Until the Office is able to point to particular and specific disclosure in the prior art which discloses all the elements of the claim, a prima facie case has not been made. *See* M.P.E.P. § 2142 ("The Examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the Examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness"). Here, the Examiner refers Applicants to Derndinger col. 4, lines 13-17. This text discloses that "[t]o record complete reflection profiles with good resolution it is advantageous to provide an adjusting device which makes it possible to move the illumination grid and the object relative to one another in planes perpendicular to the optical axis so that the object is scanned with the illumination grid." This text does not even come close to suggesting adjustment of the illumination pattern such that only the desired particular pixels of the surface of the microarray are illuminated. It only discusses moving the illumination source and the object closer to and farther from each other to produce resolution when using confocal techniques. Thus, the Office has not provided any evidence whatsoever that any of the cited references disclose or suggest this element of the claim. The

rejection should be withdrawn for the reason that the Examiner has not made out a prima facia case of obviousness.

Applicants respectfully request withdrawal of each of the currently pending rejections under 35 U.S.C. § 103(a) over the Pirrung and Derndinger references and the rejection of claims as obvious over these references in further combination with Cerrina for the reasons discussed above. The Office has failed to make out a prima facia case of obviousness by pointing out disclosure of each and every claim element in decided references. In summary, the Derndinger reference is not analogous art which does not teach adjustment or confirmation of the pixels of light which are illuminated in a pattern on the surface of an array. The Pirrung reference refers to making a biochip using mask technology and also differs from the invention by failing to use an illumination matrix detector and the step of detecting. Neither of these references discloses or renders obvious at least one element of the claim. The Cerrina reference does not make up for these glaring defects because it likewise does not discuss any manner for detecting location specific illumination using a light sensor matrix which is recited in claim 1(c).

The Office has maintained a rejection on the ground of non-statutory obviousness type double-patenting over claims 1, 5, 6 and 35 of co-pending application 09/763,914. This patent application has issued as U.S. Patent No. 7,097,974. Applicants are including with this response a Terminal Disclaimer over this patent. Applicants therefore request withdrawal of this double-patenting rejection.

The Office is rejecting claims 1-11, 13-18, 21-23, 27-52 and 56-57 on grounds of failing to comply with the written description requirement. This new matter rejection is based on the Office's assertion that claims 1, 27 and 56 have been amended to include building blocks for chemically functional materials as binding materials and that the specification as originally filed provides no support for chemical building blocks. Applicants would like to point the Examiner to original claim 1, which recites "binding said biologically or chemically functional materials or building blocks for such materials." Applicants submit that this language fully supports the language of claim 1, step (d) as presently pending and the analogous language of claims 27 and 56. Applicants also point the Examiner to page 7, lines 34-36, and page 9, lines 10-12, for


this disclosure. Applicants would also like to point to the previous versions of the rejected claims, which also fully support the language now contained therein.

Step (d) of claim 1 and the analogous portions of claims 27 and 56 were amended to place Markush or "group" claim language into a more traditional American format, as requested by the Examiner on page 5, lines 2-7, of the Office Action dated June 9, 2006. Applicants submit that the immediately preceding language "binding said biologically or chemically functional materials or building blocks for said materials" contains each of the four items now listed in Markush format in the same claim. No new matter was added to the claims concerning chemical building blocks since the claim scope was not changed and all matter in the amended claim was supported by its immediate predecessor claim as well as by the specification as filed with its claims. The phrase "building blocks for said (chemically functional) materials" of the immediately preceding claim is the same language now contained in step (d)(4) of claim 1. By virtue of this, the rejection was not necessitated by Applicants' amendment to the claims but was improper since the amendment only made formal changes to Markush claim language. Applicants request withdrawal of the new claim rejection under the first paragraph of 35 U.S.C. § 112 for the above reasons.

Applicants now request reconsideration of the claims and allowance of the application.

Respectfully submitted,

By



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